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ABSTRACT

The study examined learned helplessness in approximately 200 elementary aged learning disabled (LD) students and the effectiveness of classroom based attribution training and coping skills training for these children. Ss received one half hour training 3 days a week for 5 weeks in a program which used techniques of modeling, direct instruction, and reinforcement to provide effective coping strategies for difficult problem solving. The program began with novel nonacademic tasks with a gradual increase in the amount of academic work presented. Students were encouraged to "rethink" out loud desirable self statements and to cope with the possibility of failure in challenge items. The three teacher groups either received the full workshop training, received a workshop training focusing on rethinking and success but not including challenge items, or received a workshop training on learned helplessness without the specific rethinking and challenge techniques. Results indicated that the LD children tended to have negative personal attitudes and beliefs about academic achievement. The program appeared to have its greatest effects on skills related to persistence. There were no significant differences between the experimental group and the group which did not offer challenging tasks (though these teachers may have spontaneously offered more challenging activities). The program had minimal impact on attitudes. Although parents and teachers rated the LD boys higher in helplessness, the LD girls had attitudes about achievement which were more self blaming than those of boys. The teachers had positive reactions centering on the program's effectiveness in translating affective educational guidelines into specific program objectives. (DB)

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ATTRIBUTION TRAINING FOR CHILDREN WITH LEARNING DIFFICULTIES

FINAL REPORT TO THE LAIDLAW FOUNDATION

JUNE, 1980

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Adele Thomas

Program Objectives

Despite continuing ambiguity in definitional and treatment issues related to learning disabilities, the last several years have witnessed significant development in the areas of skill training and the elaboration of cognitive processes among exceptional children. The efficacy of certain training programs has been demonstrated for children with a variety of exceptionalities such as hyperactivity, impulsivity, and deviant behaviour (Bugental, Whalen, & Henker, 1977; Camp et al., 1977; Meichenbaum & Goodman, 1971). At the same time the syndrome of learned helplessness has been identified as a significant contributing factor in the perpetuation of learning deficits (Hiroto & Seligman, 1975). Those learning principles which have been effective in promoting skills of reflective problem solving, pro-social behaviour, and increased attention have been successfully implemented to demonstrate reduction in the negative motivational influences of learned helplessness (Dweck, 1975).

While the accumulation of these research data have been impressive, generalizability has been limited to one-to-one clinical settings. Thus while implications for educational practice are clear, these results have not been adequately disseminated to the educational community

(Thomas, 1979b). The concepts of learned helplessness are unknown to most educators and the learning principles underlying the various experimental training approaches have been minimally understood by special educators. Therefore, the present program had as its primary objective the application of the learned helplessness retraining paradigm to an educational setting whereby teacher-mediated training was conducted in groups for children with learning disabilities. It was hoped not only to realize training effects for this group of children, but also to increase teacher awareness of the concepts of learned helplessness and teacher use of training procedures. Another objective set was the evaluation of children with learning disabilities with respect to estimates of learned helplessness, achievement explanations, and task persistence. While logic strongly suggests that learned helplessness would be a potent factor in the learning styles of learning disabled children, few child studies have sampled the learning disabled population with respect to learned helplessness. In addition, the construct of learned helplessness has been the subject of measurement controversy focused on the relative power of questionnaire methods and behaviour assessment to adequately identify this construct. Thus, the present program

was planned to study variables associated with learned helplessness among a learning disabled sample and to explore the effectiveness of classroom-based coping skills training for children who have experienced school failure.

Overview of the Program

The Halton Board of Education comprises a student population of about 55,000 in a mixed rural-suburban community. In October, 1979, all special education teachers of students with specific learning difficulties were invited to participate. Thirty-six teachers participated in two half day training workshops. This was followed by a five week classroom program involving 223 students identified as having specific learning difficulties and ranging in average age from 8 to 12. Two weeks before and after the program was underway students were tested in small groups on task persistence, achievement explanations, school attitudes, locus of control, and effort/ability attributions. As well, teachers rated their students on helplessness and projections of future achievement. A sub sample of 40 parents was also interviewed and rated their children on school achievement and adjustment. All other parents received questionnaires by mail. In addition, a group of average achieving students was selected who were not classified disabled in any area. This group received only the pretesting instruments.

Within the Halton Board, the program was labelled "Responsibility for Learning" and focused on the statements and perceptions of learning disabled students concerning success and failure. It has been shown that self-statements about achievement ("I can do this..", "I'm smart at...") are related to subsequent expectations and can exert a strong influence on the outcome of events. Thus, children who give up before they start, based on their own inner dialogue about an outcome, never give themselves the chance to experience success. In addition, when success or accomplishment occurs it is viewed as a chance event, unstable, independent of the individuals impact. The present program sought to use techniques of modelling, direct instruction, and reinforcement to teach more effective strategies when faced with "challenge" tasks or with failure. A recent study by Diener and Dweck (1978) offered some guidelines for the type of coping skills to be taught. Using a variety of problem solving tasks, these authors studied children who were considered "helpless" or "mastery oriented". They noted that among the helpless, when faced with difficult but manageable tasks, these children resorted, early in the task, to absolute remarks of dislike, inability concerning the task or to distracting comments in order to remove themselves from the task. More significant for the purposes of our program, was the approach of the "mastery

children". Not only did these children not engage in negative self-statements. The self-talk involved the use of coaching, encouragement, and directions to enable the child to stay at the task, to try other solutions and to maintain a positive feeling of accomplishment at the conclusion. Some examples of such mastery comments included:

"I should slow down and try to figure this out."

"The harder it gets the harder I need to try."

"I love a challenge."

"I've almost got it now."

It was the goal of the program to systematically teach these substitute coping strategies for difficult problem solving to children who have experienced extensive school failure and who might be expected to have developed negative attitudes towards learning and maladaptive techniques for coping with failure.

After initial teacher training, the program was scheduled for one half an hour three days a week for five weeks Each week different topic materials were used in order to gradually approach academic tasks and to introduce the element of skill generalization into the program.

Training Format

Each session used a uniform structure starting with an introduction followed by student work in three separate

booklets. Before starting on task materials each day, the teacher introduced the main program objective - to use "hard worker" thoughts. He/she gave examples and encouraged students to talk aloud. During the lesson materials were arranged so that items of increasing difficulty were interspersed within the lesson. In order to insure that the children began and ended each lesson with success experience, the materials were divided into three booklets, each containing from 5 to 10 items, depending on the topic. Books 1 & 3 contained success items within mastery level. In Book 2 at least 50% of items were above the mastery level. This was accomplished by extending the number of operations involved in a problem or by decreasing the amount of time required to solve the problem. The use of booklets allowed the teacher to use the period between finishing one and starting the next in order to verbally reinforce mastery comments, discuss student attitudes, and help students rehearse for the next booklet. As the program content became more academic and faster paced, the use of booklets was faded out. Nevertheless, the use of challenge tasks was maintained with the inclusion of difficult items in 1/3 of daily lesson materials. Teachers continued to arrange materials such as spelling words, so that students began and ended the lesson with success.

At the end of the lesson teachers urged their students to use throughout the day the thoughts and work skills they had practiced. Teachers were also encouraged to keep a daily record of student response to the lesson along with mastery comments for each child.

The program began with novel non academic tasks (puzzles, mazes) in order to allow teachers to focus on the coping skills program as something new to be learned and to give students time to practice their rethinking skills in the absence of possible negative attitudes about certain kinds of school work such as spelling or arithmetic.

In summary, two aspects formed the basis of the training program. The technique of "rethinking" out loud was used to help children become more aware of desirable self statements and to contrast those with actual thoughts. The inclusion of challenge items helped to recreate the setting which helpless children try to avoid, namely the possibility of failure. Without the "in vivo" experience, it is easy to practice skills or to imitate what the teacher wants without ever making the connection to use those skills spontaneously when they are required by circumstance. It is only by using skills in the context of the recreated experience of problem solving difficulty,

with all of its attendant anxiety and frustration, that such skills will become consolidated. Thus, the program was designed to evaluate the effectiveness of these two elements of training.

Training Groups

The program was open to all special education teachers in the Halton Region, with the stipulation that they work with a minimum of three SLD (Specific Learning Difficulties) pupils. Of 53 eligible teachers, 48 indicated interest in participating. 36 teachers met the selection requirement and were accepted for the program; two subsequently dropped out. Teachers were randomly assigned to one of three groups after consideration to two factors: teacher experience and type of special education class. Teachers filled out questionnaires on type of class and degree of pupil integration together with extent and type of teacher experience. In addition, administrative classification of classes was checked in order to verify integration categories. Teachers were thus randomly assigned to groups, controlling for teacher experience and degree of integration.

Experimental Training Group - Ten teachers received workshop training which, in the context of learned helplessness, fully discussed the two basic elements of the program, namely, rethinking techniques and the inclusion

of challenge items. Not only were these elements highlighted but also student materials for this group included the format whereby Booklet 2 in each lesson contained at least 50% of items at an increased level of difficulty.

Training Control Group - For this group of 12 teachers, the concept of learned helplessness was fully presented, but workshop training focused only on rethinking techniques. Challenge items were not made a focal point of teacher workshop. Student materials were restricted to items which were within individual ability levels.

No Treatment Control Group - In this group, 12 teachers received the same amount of workshop training and introduction to learned helplessness concepts. However, focus was on the general social-emotional needs of children and a discussion of resources to develop self-concept. It was explained to these teachers that funds were insufficient to extend the program. Nevertheless, they would be informed of the outcome. All agreed to participate in the pre-post data collection.

Non SLD Group - A group of 52 regular class children was identified in two schools and formed the basis of a preliminary comparison with SLD children.

Methodology

Subjects

Children - The program was conducted in 29 schools throughout the Halton Region for 204 children who ranged in age from eight to twelve. Eligibility criteria for SLD placement included basic learning capacity within the average range (I.Q. $\geq$ 85) and academic achievement in Language Arts and/or Math at least one year below grade level. For the purposes of our program, additional criteria included the elimination of those children whose learning difficulties were primarily the result of sensory deficits, social-emotional maladjustment, or other physical handicaps. Nevertheless, class groupings were kept intact throughout the program, such that all the students in a class, regardless of individual eligibility, participated in the program and received pre-post testing. Classes ranged in size from three to nine.

An initial pool of 168 boys and 38 girls in programs for children with specific learning difficulties (SLD) were identified for the project. Average age for boys was ten years, two months (SD = one year, seven months); for girls the average age was nine years, nine months (SD = one year, seven months). No significant sex differences were found for either IQ or achievement variables. Intelligence test scores based on individual

assessments (WISC-R) yielded an average IQ of 95.7 (SD = 10.7) for the SLD group. Achievement data were based on the Wide Range Achievement Test (WRAT) and expressed as average grade scores. For Arithmetic, Reading and Spelling the average grade equivalents were 3.9, 3.6 and 3.6 respectively for SLD children.

A comparison group of 22 boys and 30 girls from grades three to six was also selected from two schools in the same attendance area as SLD classes. All regular grade students were judged to be working at least at grade level based on teacher reports, and at least at the 50 percentile on standardized achievement tests (Canadian Tests of Basic Skills). In addition, school records were analyzed to insure that no student in this group had a prior history of learning problems. The average age of girls in this group was nine years, eight months (SD = ten months); the average age of boys was nine years, five months (SD = one year, nine months).

For the evaluation of training groups the SLD sample included only those subjects for whom both pre and post test data were collected. Thus the final evaluation sample consisted of 142 students after adjusting for the random effects of illness and transfer of students and one teacher. The Experimental Training Group of 51 students consisted of 45 boys and 6 girls;

the Training Control Group of 51 students was composed of 42 boys and 9 girls; the Control Group of 40 subjects contained 34 boys and 6 girls.

Teachers - 34 teachers in 29 schools completed the program. Three schools contained two SLD special education teachers while one school had three such teachers. In order to maintain independence of treatment groups, after a teacher had been randomly assigned to a treatment group, the other teachers in that school were assigned to the same treatment group. Five male and twenty-nine female teachers participated in the program. All teachers had prior experience as regular class room teachers. In addition, 50% of teachers had at least five years of special education teaching experience, while no teacher had less than two years of experience as a special education teacher. There were no significant differences among SLD training groups with respect to levels of teacher experience.

Instruments

(The Appendices have not been included in this document due to copyright restrictions).

Student Evaluation

Bridge Task - Because learned helplessness has been linked to school behaviours of task completion and persistence (Andrews & Debus, 1978), a goal of the coping skills program was enhancement of task persistence. An adaptation

of persistence measures used by Ames (1978), the present task was designed to measure persistence in small groups of children. The bridge task presented as soluble an insoluble puzzle, that of crossing a series of bridges in a specified way in order to reach a goal (see Appendix B for Bridge Task Items and Task Instructions). Additional copies of this insoluble puzzle were available so that each student could try the task as often as he/she wished. Persistence was measured as a) amount of time spent at the insoluble puzzle before trying a second soluble one, and b) the number of copies of the insoluble puzzle tried.

After solving the second soluble bridge puzzle, each child was asked to choose either the first or the second puzzle during free time period. This choice has been taken as an indirect measure of frustration tolerance and is related to persistence (Feather, 1969).

Attribution Assessment - Performance on the bridge task was the basis of behavioural attribution assessment. This task was adapted from work by Nicholls (1978) and others (Andrews & Debus, 1978). Given problem solving with failure outcome (two insoluble puzzles) and success outcome (two soluble puzzles) presented in alternate order, students gave reasons for their performance using four categories; ability, effort, task difficulty, luck.

Immediately after the first two bridge puzzles were completed, students received a poster with four pockets representing each of the four attributional categories. On each pocket was a cartoon depicting each of the causes. For example, a smiling boy with a light bulb over his head signified something like "I am smart"; a horse shoe signified good luck. One side of the poster referred to success problems while the reverse side referred to failure problems. After explaining each of the four categories and using a practice example, every student was instructed to consider each of the first two bridge puzzles. Students then had to choose from the four poster attributions a reason which best explained performance. Choice was indicated by selecting a coloured tab from the appropriate pocket. Two additional puzzles were given (soluble and insoluble) and after each, the same attribution procedure was followed.

Effort/Ability Attributions were recorded with a ten item questionnaire which required each student to choose either ability or effort explanations for hypothetical situations of failure and success (Andrews & Debus, 1978). (See Appendix C)

In addition to measures of persistence and attribution, measures of student perceptions of ability and

internal-external locus of control were used. An abridged version of The Student's Perception of Ability Scale consisted of 34 items in a yes/no format (Boersma & Chapman, 1977). This measure contributed three sub scales: General Ability, General School Satisfaction, Confidence in Academic Ability. This questionnaire had been previously standardized for Canadian school children in grades three to six. The Nowicki-Strickland I-E Locus of Control Scale for preschoolers and primary grade children consisted of 26 items presented in a cartoon format (Nowicki & Duke, 1974). All questionnaires were read for students in small groups.

Teacher-Parent Ratings

Approximately one month before the program began, teachers rated each of their SLD students on a 15 item Helplessness Scale developed by Dweck (1975), and a modified form of the Predicted Academic Performance Scale which estimated future student achievement in each of six subject areas (Chapman & Boersma, 1978).

Parents also rated their children on a similar helplessness scale and a 12 item modified prediction of academic performance scale.

This parent scale rated four subject areas and included attributional judgements about their children's performance in terms of effort, ability, difficulty

level of school work, effectiveness of school program, and luck. Finally, a 19 item General Attitude Survey for assessing parenting styles was also administered.

During the program, teachers completed a six item rating sheet evaluating aspects of the program at that time. At the end of the program each teacher was interviewed and provided an evaluation of program dimensions.(See Interview Schedule in Appendix.)

Procedures

Pre-post Testing

Children were tested two weeks prior to the program. Each of three testing teams was randomly assigned to classrooms for the pre-post sessions with the stipulation that pre-post testing would be conducted by the same team. Each team consisted of an examiner and two or three recorders. Examiners included the principal investigator and two research assistants. During testing the examiner gave instructions and assisted students while the recorders noted performance on the bridge task, free choice, and behavioural attribution task. While examiners were aware of the composition of treatment groups, recorders were naive to the nature of the program, the type of student they observed, and the existence of treatment groups. It was explained to recorders that an innovative instruc-

tional program was being introduced and that testing would evaluate the program's effect on student learning and attitude.

Nine recorders and one examiner were female; two examiners were male. Two half-day training sessions were held for recorders at pre-testing and one session at post testing, in order to acquaint recorders with the materials and to standardize timing and recording procedures.

Pre-testing was conducted in classes over two sessions. Each session lasted approximately 35 minutes. The bridge task was always given first, followed by free choice and the attribution task. All other instruments were administered in random order for classes across the treatment groups; however, the same administration order was maintained for post testing. All questionnaires were read to students and children were given individual assistance when required. Post testing was accomplished in one session since baseline measures and the Nowicki-Strickland IE Scale were eliminated. In addition, only three sub scales of the SPAS were administered such that total testing time was approximately 35 minutes.

Recorder Reliability

After training was completed, recorder reliability was evaluated using video-taped simulation of testing.

The video presentation consisted of four children who role played the Bridge task with an examiner. Student time spent on the first puzzle ranged from 57 seconds to two minutes, 30 seconds. Six recorders chosen at random individually observed the filmed students and recorded individual Bridge task times, using the experimental recording procedures. Based on an analysis of variance technique to estimate reliability (Winer, 1971). The reliability of the six recorders for observation of task persistence across four subjects was r= .99.

Training Program

After teacher workshops and pre-testing, the examiners functioned as consultants for the training group teachers. During the first week each teacher was visited and observed in order to ensure that all components of the program were carried out. Thereafter weekly contact was made by the consultants on an unscheduled basis to monitor program operation. Daily record sheets were kept by teachers and these were collected each week. In addition, mid-way through the program all classes were rated on use of recommended program structure (see rating checklist in Appendix F). In the last week of the program teachers were interviewed for their ratings of program and materials effectiveness and student progress. In addition, a rating scale had

been administered earlier to evaluate workshop effectiveness for teachers.

Results

Pre Program Comparisons of SLD and Average Achieving Students

Student differences on indices of task persistence, ratings of helplessness, perceptions of academic ability, and internal-external control were evaluated by means of a series of one-way analyses of variance. Table 1 provides a summary of mean scores for both student groups on these variables. In addition, inspection of correlation matrices (Tables 2 and 3) indicated that significant sex and age differences occurred. These differences will be discussed as part of the examination of major dependent variables.

Measures of Persistence

For both groups BT and BI were positively correlated ($r(SLD) = .525$, $p \leq .001$; $r(non\text{-}SLD) = .602$, $p \leq .001$). These data further supported the reasoning that both time and number of attempts are related aspects of persistence. SLD students spent significantly less time at the more difficult first puzzle ($F = 13.85$, $p \leq .001$) and made fewer attempts at this task ($F = 44.91$, $p \leq .001$) than did average achieving students.

Choice of puzzle during free time was analyzed by means of chi square methods. SLD students were less likely than average achievers to return to the more difficult puzzle ($X^2 = 16.99$, $p \leq .001$). Within the SLD

group, sex was significantly related to FC (r= .150, $p \leq .05$) whereby SLD girls were least likely to attempt the difficult task (see Table 4). Again within the SLD group, age was negatively related to the FC measure of frustration tolerance (r= -.266, $p \leq .001$) such that older students were less likely than younger ones to return to the difficult puzzle during free time.

Parent-Teacher Ratings

Parents of SLD students rated their children higher in helplessness than did parents of non SLD students (F= 55.51, $p \leq .001$). Teacher ratings of helplessness (HT) were not available from regular class students due to demands of larger class size. On the other hand, teachers and parents of SLD students were similar in their estimates of helplessness among SLD children. A significant correlation between sex and HT (r= .181, $p \leq .02$) indicated that teachers tended to rate SLD boys higher than SLD girls in helplessness.

Student Perceptions and Attributions

Students' own perceptions of their ability were recorded across common academic tasks (SPAS) from penmanship and neatness to arithmetic and reading. SLD students rated themselves lower in general ability (GA) and indicated a greater dislike of a range of school tasks (SS). Significance tests for GA and SS respectively were, F= 7.66,

$p \leq .006$; $F = 4.38$, $p \leq .037$. Nevertheless while overall self perceptions of school ability (SPAs) were lower for SLD than for average achieving students ($F = 13.95$, $p \leq .001$), SLD and average achievers rated themselves similarly in self confidence (SC). This scale included such items as, "When school gets tough, I give up", "I'm a smart kid", "I find new things difficult to learn." For both SLD and non SLD groups there was a decrease in School Satisfaction and Self Confidence scores with increasing age, as well as a decrease in overall perception of school ability (r (non SLD)= - .303, $p \leq .05$); r(SLD)= - .205, $p \leq .005$). In addition for both SLD and non SLD groups, girls rated themselves higher in enjoyment of school activities (SS) than did boys ($F(SLD) = 4.30$, $p \leq .05$).

Self perceptions of internal versus external control over events (LOC) indicated that SLD students were more apt to attribute responsibility for events to external sources such as luck ($F = 4.76$, $p \leq .03$). Within this SLD group, girls were more likely than boys to perceive responsibility for events in external sources ($F = 14.73$, $p \leq .001$). While average achieving students increasingly made internal choices with age ($r = -.270$, $p \leq .05$) this age trend was not observed for SLD students.

Based on Effort/Ability Scale (EA) scores, there

was no support for the hypothesis that SLD students used stable (ability) explanations for failure more frequently than did regular students or that SLD students were less likely than regular grade peers to use effort explanations for failure or success. Nevertheless, girls more than boys, regardless of instructional grouping, attributed failure to ability ($F(SLD) = 4.59$, $p \leq .05$; $F(\text{non SLD}) = 6.13$, $p \leq .02$). On the other hand, girls were less likely than boys to attribute success to ability ($F(SLD) = 6.21$, $p \leq .08$; $F(\text{non SLD}) = 22.36$, $p \leq .002$). As with the LOC measure, there was a trend toward increased use of effort explanation with age for average achievers ($r = -.364$, $p \leq .001$). This trend was not observed for the SLD group.

Chi square analyses were performed to evaluate student attributions made after failure and success experiences (bridge puzzle). Overall group differences for failure attribution were significant across the four categories of attribution ($X^2 = 23.51$, $p \leq .001$). Inspection of Table 5 indicates that task difficulty accounted for most of the regular students' explanations for failure. While task difficulty also accounted for a large proportion of SLD explanations, a significant number of SLD students also resorted to luck and ability to explain failure. When attributions were made after

success experience, regular and SLD students responded similarly and no significant differences were found. Nevertheless there was a trend toward more frequent use of luck to explain success among SLD students.

Significant sex differences were found across the four categories of attribution. After a failure task, significant differences between SLD and non-SLD boys were as follows: $X^2=17.25$, $p \leq .001$. 95% of regular grade boys attributed failure to task difficulty while none of these boys used effort or ability explanations. On the other hand, about 11% of SLD boys used ability explanations, while luck accounted for 30% of SLD male explanations.

The most noteworthy sex difference occurred among SLD girls' use of ability explanations for failure. Female SLD students represented the largest proportion (22.9%) to use lack of ability to explain failure compared to 8% of average achieving females. This also contrasted with male groups' (11.3% for SLD boys, 0% for regular grade boys) use of ability explanations for failure.

Significant differences were also found for explanations of success among male students ($X^2=7.73$, $p \leq .05$). After successfully completing a puzzle more SLD boys (18.4% used luck as explanation than did non SLD

(4.6%). On the other hand SLD boys were less likely to use ability to explain success than were non SLD boys (15% of SLD vs. 38.8% of non SLD). SLD girls were not significantly different from their average achieving peers in explanations of success.

Discussion of Pre-Program Group Comparisons

In the present project, children with specific learning difficulties were found to differ from their average achieving age and grade peers on all of the attitudinal variables related to academic achievement except the Effort/Ability Scale. Further poor performance by SLD children on measures of task persistence and frustration tolerance supported initial hypotheses concerning the detrimental effects of learning history among disabled children.

That the E/A Scale did not identify attributional differences for the two learning groups should be considered in light of significant differences found when attributions were recorded for specific failure and success experiences (puzzles). Andrews and Debus (1978) also noted similar results such that E/A scale scores were not related to task persistence while behavioural techniques for eliciting attributions were related. In an earlier pilot study by this author (Thomas, 1979a), it was found that SLD children were sensitive to values for effort and persistence based on interviews and paper-pencil questionnaires. They also made little use of poor ability as an explanation for failure. It was suggested that

questionnaires present children with statements about hypothetical achievement statements, which may also reflect additional value statements. On the other hand, the behaviour test situation (the bridge puzzle task) brought both failure and success experiences within more personal, immediate awareness. The differences that emerged between SLD and non SLD children in this experimental situation may reflect those explanations for achievement that more closely resemble children's actual attributional processes. This discrepancy in type of test condition is relevant for instructional and diagnostic guidelines. It may not be accurate to rely on global statements related to achievement expectation or paper-pencil measures of attribution to determine a child's attributional style. In order to most accurately assess the child's thinking processes related to achievement, it may be necessary to simulate a failure/success situation in order to monitor the child's personal logic. The present results suggest that questions which ask, "What should you.." or "What would you do.." lead the child to a different set of achievement explanations, which may not be congruent with thoughts as measured by simulating actual achievement experiences.

The SLD children in this project emerged as a group

whose perceptions of academic ability and locus of control were more negative than that of regular grade peers. As well, these attitudes were related to lowered task persistence and frustration tolerance. Among SLD students girls fared most poorly in some respects. SLD girls compared to other students, both SLD and non SLD, were least willing to attempt challenging tasks in a free choice condition, were more externally directed compared to SLD boys, were more likely to attribute failure to poor ability while least likely to take personal credit for success. Nevertheless SLD girls were more likely than any of the group to accept a stable personal explanation for failure (ability). It has been reasoned that ability explanations for failure are most debilitating because they lead to continued failure expectations. This negative picture is somewhat alleviated by the evidence that girls seem to enjoy school to a greater extent (SS) and are rated less helpless than boys by parents and teachers.

Effects of Attribution Training

Pre-post test data were evaluated across the three training groups by means of a series of analyses of covariance, controlling for pretest, age, and helplessness rating by teacher (See tables 7 and 8).

Significant differences were found for BT time spent at task, ($F = 5.69$, $p \leq .005$) and for BI, number of attempts at the difficult puzzle ($F = 3.77$, $p \leq .025$). Comparisons of pre and post means in Tables 2 and 6 illustrate the differences across the three groups. Experimental and Training Control group means differed significantly from the no-training control group by the end of the program. Over the two month project period, persistence scores decreased for those SLD students who did not receive training. Both training groups were not significantly different from each other. Nevertheless there was a trend in the Experimental training group only toward an increase in persistence scores by the end of their program.

For BI, Experimental and Training Control subjects differed from no-training Controls with means of the two former groups almost double that of the latter group.

At post training, the three SLD groups differed on the free choice task ($X^2 = 8.88$, $p \leq .01$). Inspection of the frequency of choice percentages for the training groups (Table 9) indicates that change occurred within the Training Control group. From the standpoint of pre-post training differences there was a tendency for Training Controls to increase choice of the difficult puzzle ($X = 3.25$, $p \leq .07$). No significant pre-post

differences were found for Experimental and no-training control groups.

It will be recalled that sex differences occurred for FC before training, with a significantly greater number of SLD males than females choosing the difficult puzzle. In analyzing pre-post comparisons for FC there was an overall increase in female choice of difficult puzzle so that no further significant sex differences were noted at post test. The observed shift to the difficult puzzle was found among females in the Training Control group.

At post testing the only attitudinal measures readministered were the Effort/Ability Scale and three subtests of the SPAS. No significant differences were found among the SLD groups and these scores continued to be significantly lower for the three SLD groups compared to regular class students.

With respect to attributions based on assessment after failure and success conditions, no significant training effects were noted for the three SLD groups.

Additional analyses are underway on other teacher and parent variables. These analyses are ancillary to the stated objective to report major results on program effectiveness. Therefore additional summaries will be

forwarded to the Laidlaw Foundation as these secondary analyses are completed.

After training, interviews were conducted with Experimental and Training Control teachers with respect to student change, the majority (88%) of the teachers observed the development of coping skills in their students as follows:

- increase in use of mastery comments
- increase in use of positive statements about academic activities
- more willing to ask for help
- more accepting of mistakes
- more willing to take risks
- more care and accuracy on tasks
- using time more effectively
- increase in pre-planning activities
- increase desire to attempt solutions on own
- less frustration

With respect to other school subjects, the majority of teachers observed that some of their students had extended persistence and effort skills as follows:

- increased confidence in Science and Social Science
- use of personal dialogue ("I didn't like doing this before, but now I do.")

In addition, teachers noted that the focus on attribution training facilitated communication in the classroom. Children more frequently discussed their feelings about school work and their academic expectations. Some teachers reported that they found it easier to motivate some of their students who previously had been difficult to engage in academic activities.

Conclusions

The results of this project clearly established that negative personal attitudes and beliefs about academic achievement predominate among children with learning difficulties. The program appeared to have its greatest effects on those skills related to persistence. The differences between the Experimental group and the Training Control group appeared minimal. Nevertheless it must be recalled that monitoring of daily instruction was not possible, although the experimenters completed class observations throughout the course of the program. Several Training Control teachers noted that their materials (success only) were not challenging enough, or did not allow them to test the limits of students' newly attained coping skills. Hence those special educators appeared to be sensitive on an intuitive basis to the need for planned difficulty. Since the program director was interested in fostering a meaningful understanding of attribution training among special educators, teachers were encouraged to incorporate training principles into particular teaching styles. As a result, it is possible that some Training Control teachers sufficiently adapted the "success only" materials to incorporate more challenge for students. Hence the distinction between the two

groups may have blurred. However, the experiences of teachers and the research staff suggest that the optimal training procedure was one based on systematic use of mildly frustrating material in order to develop frustration tolerance through effective coping strategies.

The program seemed to have minimal impact on attitudes as measured by a variety of questionnaires (LOC, SPAS, EA). This limitation has been noted elsewhere (Ames & Debus, 1978; Bugental, et al, 1977; Dweck, 1975) and may be explained in part by the short training period. Nevertheless the self-talk procedure was activity-directed so that teachers focused on those strategies which helped students become more flexible and persistent at a variety of tasks. Therefore the self-talk procedure was used to develop mastery strategies such as, "If I say these numbers to myself, maybe that will give me a clue." Thus, the daily class activities increasingly focused on strategies for problem-solving as <u>substitutes</u> for negative self statements rather than on reflection about <u>why</u> one succeeded or failed. It might be expected that generalization would be limited from acquisition of mastery strategies for task completion to effort/ability attributions and global estimates of school satisfaction.

For an SLD population, techniques for measurement of attributions made after success and failure should be reviewed. At pre test the bridge puzzle which was novel and interesting indicated significant differences in comparing SLD and non-SLD attributions. However, at post testing, when the objective was to detail effects of training among the three SLD groups, the bridge puzzle was not a sensitive enough instrument to identify subtle changes that may have occurred among the three groups. The bridge task may have been a reactive measure which owed its initial effectiveness to novelty. For SLD children negative attributions may be specific to academic tasks, so that it may be necessary to develop attribution assessment based strictly on academic tasks. Such assessment would have to be tailored (reading and math levels) to individual SLD achievement, but within this framework, materials such as anagrams and math problems may be more sensitive to elicit attributional differences among SLD children.

The sex differences that emerged in this study deserve further attention. It is noteworthy that such differences in attribution were recorded among average achieving students as well as learning disabled children. Questions arise concerning the developmental and educational aspects of these different perspectives on

success and failure associated with sex. It will be necessary to further explore the attitudes and expectations of parents and teachers toward academic achievement in order to study those relationships to student perceptions. It is somewhat incongruous that while parents and teachers rated SLD boys, compared to girls, higher in helplessness, those SLD female students themselves had attitudes about achievement which were more self-blaming. It is possible that the relationship between helplessness and self-perceptions of achievement is modified by other differential adult influences on boys and girls.

Further work is needed to develop an array of those distinct problem-solving strategies associated with a variety of common learning tasks. Project teachers expressed a need for a compendium of alternate strategies linked to type of learning task, which they could refer to in teaching self-talk procedures. Thus a sourcebook would list the distinct features of a variety of learning tasks, note general effective strategies such as visual scanning and further specify examples of actual mastery comments to be modelled. It was agreed by all teachers in the project that such a sourcebook of basic academic tasks, arrayed in a hierarchical order, would be invaluable in developing

long-term, flexible cognitive strategies for those children who seem deficient in adequate use of verbal mediation.

Finally, the nature of the present research design did not proceed from the point of view of a detailed study of the process of children's attribution-making during training. Such a design would involve a one-to-one daily monitoring of student performance. On the other hand this study presented well established concepts of attribution theory and their effects on children with learning difficulties to a wide audience of special educators. The program results were encouraging in demonstrating that a self-talk approach based on retraining attributional style had desirable effects on task persistence and frustration tolerance. Teachers' impressions of the program supported this conclusion. Their positive reactions centered on its effectiveness in translating affective educational guidelines into specific program objectives for children with learning difficulties.

After completion of the training program follow-up workshops were conducted with teachers and with parents of participating students. Among teachers, it was found that many continued to use the program and that in two schools project teachers had provided in-service

to their regular class colleagues who had expressed interest in using the approach. It has been further proposed by the Special Services division of the Halton Board of Education to present the completed review of the project to the members of the Board in order to consider adoption of the program as part of Halton special education curriculum. Therefore, it is hoped that the impact of the program will have further positive long-term consequences for the education of children with learning difficulties.

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Table 1

Group Means of SLD and Average Achieving Students on Selected Dependent Variables at Pre-Testing

GROUP		BT	BI	FC	HP	HT	LOC	SPAS	GA	SS	SC	EA	EAS	EAF
SLD	$\bar{X}$	258.35	5.42	96/83	2.92	2.71	12.90	42.25	7.26	6.97	4.37	4.33	2.12	2.21
	SD	140.48	4.29	FC=# of Ss	.58	.79	2.86	11.82	2.81	3.27	2.35	1.87	1.40	1.41
NON-SLD	$\bar{X}$	340.52	10.40	45/7	1.99		11.92	49.02	8.46	8.02	4.73	4.57	1.96	2.62
	SD	136.33	6.05	FC=# of Ss	.68		2.99	10.54	2.64	2.88	2.36	2.10	1.61	1.61

BT Time spent on first bridge puzzle (in seconds).

BI Number of attempts on first bridge puzzle.

FC Choice of Puzzle one/two during free time.

HP Helplessness Scale - Parent ratings.

HT Helplessness Scale - Teacher ratings.

LOC Nowicki-Strickland IE Scale

SPAS Student Perception of Ability Scale.

GA General Ability subtest of SPAS.

SS School Satisfaction subtest of SPAS.

SC Self Confidence subtest of SPAS.

EA Effort Ability Scale; EAF - Failure items of EA Scale; EAS - Success items of EA Scale.

Table 3

Correlation Matrix of Program Variable for Average Achieving Students

	BT	BI	FC	EA	LOC	SS	GA	SPAS	AGE	SEX	HP
BT	1.00	.602***	-.168	.281*	.037	.019	.221	.106	.156	-.115	.076
BI	.602***	1.00	-.017	.160	.011	.012	.052	.016	.155	.033	.195
FC	-.168	-.017	1.00	.080	-.275*	.076	.038	.118	-.141	-.118	.157
EA	.281*	.160	.080	1.00	.199	.164	.063	.229	-.364***	-.062	-.184
LOC	.037	.011	-.275*	.199	1.00	.035	-.171	.008	-.270*	.143	.015
SS	.019	.012	.076	.164	.035	1.00	.278*	.674***	-.295*	.347**	-.154
GA	.221	.052	.038	.063	-.171	.278*	1.00	.651***	.138	-142	-.373*
SPAS	.106	-.016	.118	.229	.008	.674***	.651***	1.00	-.303*	-155	-.136
AGE	.156	.155	-.141	-.364***	-.270*	-.295*	.138	-.303*	1.00	.085	.101
SEX	-.115	-.033	-.118	-.062	.143	.347**	.142	.155	.085	1.00	.028
HP	.076	.195	.157	-.184	.015	-.154	-.373*	-.136	.101	.028	1.00

* $p \leq .05$

** $p \leq .02$

*** $p \leq .001$

Table 4

Choice of Puzzle during Free time by Group and by Sex
(Expressed as Percentage of Students)

FC	SLD		Non SLD	
Puzzle	Male	Female	Male	Female
Insoluble	57.2	38.2	81.8	90.0
Soluble	42.8	61.8	18.2	10.0

Table 5

Percentage of SLD and Regular Class Students Making Attributions for Success and Failure on Two Puzzles

	Failure Puzzle		Success Puzzle	
Attribution	SLD	Non SLD	SLD	Non SLD
Task	48.9	86.5	53.6	65.4
Luck	28.0	7.7	17.6	7.7
Ability	13.4	3.8	17.6	21.2
Effort	9.7	2.0	11.2	5.7

Table 6

Means and Standard Deviations of Post Test Scores for Three Experimental Groups of SLD Students

SLD Group		BT	BI	EA	EAS	EAF	GA	SS	SC
Experimental	$\bar{X}$	273.06	9.30	3.87	1.93	1.94	7.31	7.02	4.79
	SD	136.87	7.73	2.20	1.40	1.46	2.93	3.77	2.32
Training Control	$\bar{X}$	250.33	8.23	4.00	1.87	2.13	7.58	6.34	3.96
	SD	136.99	6.60	2.02	1.47	1.57	2.96	3.12	2.43
No Treatment Control	$\bar{X}$	192.02	5.78	4.31	1.88	2.43	7.82	6.04	4.11
	SD	128.43	5.13	2.29	1.44	1.50	2.93	3.36	2.98

Table 7

Analysis of Covariance: Bridge Time Post-test X Treatment Groups Contolling for Bridge Time Pre-test, Age, and Teacher Ratings of Helplessness.

Source of Variation	Sum of Squares	df	Mean Square	F
Covariates (Total)	228387.120	3	76129.04	4.451*
Bridge Time Pre-test	195534.990	1	195534.990	11.432
Age	27316.161	1	27316.161	1.597
Helplessness Ratings	9064.946	1	9064.946	0.530
Main Effects (Treatment Groups)	194651.590	2	97325.793	5.690*
Residual	2274916.400	133	17104.63	
Total	2697955.100	138	19550.399	

*$p < .01$

Table 8

Analysis of Covariance: Bridge Items Post Test X Treatment Groups Controlling For Bridge Items Pre test, Age and Teacher Ratings of Helplessness

Source of Variation	Sum of Squares	df	Mean Square	F
Covariates (Total)	610.178	3	203.393	5.450*
Bridge Items Pre Test	565.684	1	565.684	15.158
Age	25.419	1	25.419	0.681
Helplessness Ratings	2.057	1	2.057	0.055
Main Effects (Treatment Groups)	383.638	2	191.819	5.140*
Residual	4963.334	133	37.318	
Total	5957.151	138	43.168	

*$p < .01$

Table 9

Frequency of Choice of Puzzle (FC) Expressed in Percentage by SLD Students Before and After Training

FC		Experimental	Training	Control
Pre Training	Design 1	45	51	65
	Design 2	55	49	35
Post Training	Design 1	46	68	72
	Design 2	54	32	28